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swallowing them whole. I did not see a frog lose one, and I saw one frog catch and eat five. The butterflies seemed to make no effort to get away from them. Occasionally one would alight upon a frog's back. In about half an hour all but one of the butterflies had been caught. The frogs did not try to catch that one. It flew away, and soon three of the frogs went back into the water. The fourth one was apparently too "stuffed" to move.

For many days after this occurrence I watched the watering place, hoping that I might be able to get a photograph of the frogs and butterflies, but I did not see them together again.

I have consulted the best authorities on frogs, and I do not find such an instance recorded.

ALICE MAVOURNEEN MALLONEE

STRATTON, ME.

#### THE ALLEGED INSTINCTIVE FEAR OF SNAKES

TO THE EDITOR OF SCIENCE: Mr. T. B. Dabney's interesting letter on the "Serpent Instinct in Man," appearing in your issue of the seventh, proposes an argument substantially as follows: The fear of serpents in man is practically universal; therefore it must be instinctive. If instinctive, it must survive from a period when the serpent was a menace to the perpetuation of the human race. But such a period can only have existed before man had clothing. Therefore, it existed before his evolution from the brute was complete. But the principal locality in which man, at such a stage of his history, would have had cause to fear extinction by serpents, is India. Therefore India is probably the cradle of the human race.

To what extent the successive conclusions are supported by their premises it is not my present purpose to discuss. I have but one point to make, and that is that the fear of serpents is probably not instinctive at all. I believe it to be the result of erroneous education in childhood, perhaps accentuated by a certain timidity with regard to wild animals in general, resulting from the protected habits of civilized life.

That the fear of snakes is very general is a

fact painfully present to many who, like myself, are studying herpetology with a view to protecting our useful snakes from extermination, and our country from the incalculable losses to agriculture which would thence ensue. The desire to justify the aforesaid fear is mainly responsible for the persistence of a mass of absurd superstitions about even the commonest species of snakes. But the prevalence of this attitude is not, in my judgment, sufficient reason for attributing it to an instinct of self-preservation which was the property of a supposititious brute ancestor of man, and has consequently defied the efforts of education to dislodge it, at least when there is question of first impulses. As a matter of fact, there is an equally general aversion to toads, lizards, spiders, worms and other animals possessing unpleasant qualities. The sudden presentation of such objects produces even the "panic of horror" alluded to, in quite as many instances as the sight of the serpent. And yet, none of the other creatures mentioned can at any time have menaced the existence of the human race.

If Mr. Dabney's arguments were quite conclusive, he would be well warranted in selecting India as the birthplace of herpetophobia. He is quite correct as to the mortality annually due to serpents in that country. Its immediate cause is well known to every one acquainted with conditions there. The natives of India are frequently bitten by venomous snakes because, despite all the efforts of their European masters, they insist upon going barefoot, even when otherwise well clad. If it was the adoption of clothing which first made our primitive ancestor realize that he had an even chance in the struggle for existence, one would surely expect the essential constituent of costume in India to be a pair of boots, whatever else might be wanting.

But there is positive evidence against the theory that the dread of snakes is instinctive. First, there is the common tendency of young children to play with a bright-colored snake, as they would with any toy. An innate horror of snakes as an attribute of the human species is quite inconsistent with such a fact as this.

It is frequently observed; but its first occurrence in any individual case is usually its last. For if the child's mother or nurse be at hand, there ensues a scream of terror, a mad rush to a safe distance, and a frantic admonition, perhaps even a punishment, all of which is quite enough to make a reptile thenceforth an object of fear to the child. This is where the mischief is done. The fear thus early instilled prevents investigation; lack of investigation protects ignorance; ignorance in turn corroborates the initial fear, and thus the destruction of every serpent, large or small, becomes almost a part of the average person's moral code.

In the second place, there are not a few persons who have never in their lives experienced the aforesaid horror of snakes. I am not appealing to cases where fear has been overcome by education, but to those in which the confidence born of natural curiosity has never been destroyed by positive fear instilled in early life. I have known several persons of this class, three of whom, by the way, were women, and thoroughly normal women at that. One of these last is worthy of mention in connection with her brother. This gentleman, with whom I am intimately acquainted, remembers his first sight of a snake, when, at the age of six, he and his nurse almost trod upon a small water snake in a meadow. He still recalls how utterly puzzled he was at the terror with which his nurse hurried him away from the spot, and how entirely free he was from sharing her sentiments. A little later, in early boyhood, he developed an interest in snakes which led him to hunt them in the woods and bring them home in order to watch their actions. His sister, who was even younger than he, accompanied him and sometimes helped him in this pursuit. Their father, a physician, knowing that no venomous snakes could be found in the neighborhood, not only did nothing to dissuade the children from handling snakes, but gave them little points of information and other assistance in this amusement, which they had begun without any suggestion from him. The boy, now a grown man, and a collector of some experi-

ence, has acquired an intelligent caution in capturing large snakes, owing to several experiences with their teeth; but he has never in his life felt the slightest approach to an impulse to shrink from even the largest serpent as an object of horror and aversion.

I am persuaded that any one who cares to inquire into this subject will find other cases of a similar nature, and in sufficient number to acquit his fellow-mortals of anything like a brute instinct to shrink from the serpent kind.

W. H. McCLELLAN, S.J.

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UNDER the above caption, in *SCIENCE* for January 7, at pages 25 and 26, an argument for India as the cradle of the white race is based upon what the author calls the "instinctive horror of serpents." The evidence concerning such an instinct is altogether too unsatisfactory for one to assume that the horror is instinctive and it is by no means confined to the white race or universal within the white race. In addition, who knows that poisonous serpents were as abundant in India in the infancy of the white race as they are now? To what extent is their present abundance the result of the Buddhist inhibition against their destruction? Surely this inhibition must have had a very considerable influence, and just as surely it does not date back to the birth of the white race. Until it can be shown that the horror of serpents is instinctive and that poisonous reptiles were as abundant in India ages ago as they are now, the argument for the Indian origin of the race, based upon such a supposed instinct, can receive scant consideration.

Indians in northern New Mexico have been known to flee from archeological excavations because of the presence of a small, harmless lizard, which they consider deadly, and to refuse to return until the lizard had been caught and bottled. There is not the least evidence that this indicates an instinct arising from ancestral residence in a region inhabited by poisonous lizards. Poisonous lizards are at present too restricted in range and not abundant enough anywhere to constitute a menace,

and we have no evidence that they were ever more abundant or widely distributed. No one believes that the Indians originated in the region now inhabited by the poisonous lizards.

One who has seen young children playing with snakes, even with rattlesnakes, may well be skeptical about an instinctive horror of serpents. Mothers in some regions have found it advisable to deliberately teach their children to fear snakes, in order to prevent them from handling the dangerous species. In other cases the fear probably comes from association with those who had acquired the serpent horror. On the other hand there are many boys and men, and some women, who seem to be quite devoid of any such horror. The argument that one unexpectedly brought into close proximity to any kind of a snake "is suddenly seized with a panic of horror and fear," has very little weight, because it is not universally so and the same is usually the case when one is brought suddenly into close proximity with almost any kind of an animal. Does woman's proverbial fear of a mouse indicate an instinct engendered by ancestral residence in a region where such small animals were dangerous? Many beginners in biology exhibit as much horror of a worm or a caterpillar, in proportion to its size, as of a serpent.

The "instinctive horror of serpents" does not appear to be established by satisfactory evidence.

JUNIUS HENDERSON

TO THE EDITOR OF SCIENCE: Mr. Dabney's very interesting letter in SCIENCE for January 7, 1916, leads me to inquire: if the fear of snakes, by man, is an indication that there were many snakes surrounding him in primitive days, what does the fear of Indians by the American mule indicate? Was the mule developed in a region where he was surrounded by wicked Indians who abused him?

Frémont mentions this abnormal fear of Indians on the part of our ordinary mules and it has been noted by others, including myself. Frémont says:

A mule is a good sentinel, and when he quits eating and stands with his ears stuck straight out taking notice it is best to see what is the matter.

For my part I noticed that our mules were as good as or better than most watch-dogs in giving warning of the near presence of Indians. Often before Indians were either seen or heard by any of our party the mules would snort with terror, halt, shy about, and "point" in the direction of the Indian with ears sharply bent forward and a general activity that might land a poor rider on his head. Now, why was the mule so much more afraid of Indians than horses were? I do not remember any of our horses being in the least frightened. Perhaps it was the smell of the Indian the mule detected, for their scent is very keen, but if it was the scent, why did the scent disturb them?

When we had Indians travelling with us, as was frequently the case, the mules became accustomed to their presence and were apparently unmindful of them, yet when an Indian was assigned to ride a mule there was a circus at once and it took half the camp to get him on. Once on, however, the mule being always a mighty wise being, ceased his antics and was calm as a kitten till the Indian got off and tried to remount, when we had the circus all over again. No human being can fathom the wisdom of the mule, of that I am positive, but possibly some reader of SCIENCE may be able to explain the mule's fear of Indians by some other hypothesis than that the Indian was cruel to him in the mule's original, primitive, habitat. Finally, if the fear of snakes designates the location of our primitive home where was the primitive home of the mule reasoning from his fear of Indians?

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NEW YORK

#### SCIENTIFIC BOOKS

*Robert of Chester's Latin Translation of the Algebra of Al-Khowarizmi, with an Introduction, Critical Notes, and an English Version.* By LOUIS CHARLES KARPINSKI, University of Michigan Studies, Humanistic Series, Vol. XI. New York, The Macmillan Company, 1915. Pp. viii + 164. Price \$2. In mathematics, as in art, letters, religion,